

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Expanding Access to Broadband and Encouraging)	GN Docket No. 13-114
Innovation through Establishment of an Air-)	RM-11640
Ground Mobile Broadband Service for)	
Passengers Aboard Aircraft in the 14.0-14.5 GHz)	
Band)	

COMMENTS OF GOGO INC.

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EXECUTIVE SUMMARY

Gogo Inc. (“Gogo”) has a decades-long history in the aviation communications sector and is currently the leading provider of in-flight connectivity. Based on its own experience, Gogo can attest to the immediate demand in the marketplace for additional in-flight broadband capacity. Accordingly, Gogo supports the Commission’s proposal to allocate 500 MHz of spectrum in the 14 GHz band for a new Air-Ground Mobile Broadband Service (“AGMBS”). In developing the rules for the new service, the Commission should, consistent with its statutory obligations, focus on three primary goals:

- Maximize the number of potential licensees/competitors in the band
- Ensure the prompt delivery of new service to the public
- Promote the efficient and productive use of the spectrum

Gogo submits that these goals can best be accomplished by dividing the band into four license blocks of 125 MHz each, with a limit of one license per bidder at auction. A single 125 MHz license – 41 times larger than Gogo’s current 3 MHz air-ground license – should provide a licensee with sufficient spectrum to offer in-flight broadband speeds comparable to those of terrestrial providers for years to come. With more licenses available at auction, the cost for each will be less (although the total auction revenue could be more), which could expand the potential pool of bidders. Bidders won’t be forced to acquire more spectrum than they need, and they will be able to choose among licenses of varying degrees of existing user encumbrances.

The 125 MHz (one license) spectrum aggregation cap should extend for three years, which will allow licensees time to better assess their ability to execute their business plans. To ensure that licenses are put into the hands of those who will ultimately put it to productive use, after three years AGMBS licensees would be able to purchase spectrum from fellow licensees who have decided not to construct.

To ensure that the 14 GHz band is actually used to serve the current demand for in-flight broadband, licensees should be required to meet a five-year substantial service deadline. The proposed ten-year deadline would only encourage spectrum speculators and delay service to the public. Gogo constructed its nationwide network in 26 months. Although AGMBS base stations are more complex and costly, the relatively few numbers required (as few as 150[?] sites to provide CONUS coverage above 10,000 feet, and even fewer to meet the substantial service safe harbor), no extended construction period is needed.

To promote investment in the band and ensure the availability of a wide variety of services, the Commission should eliminate the proposed rule that restricts the use of the band to broadband services. Voice, text and low bandwidth data services should be permitted in addition to broadband. Likewise, the Commission should not prohibit the provision of aeronautical operations-related services that airlines may desire to improve efficiency and safety of flight operations.

Licensees providing voice or text services should be exempted from the 911 rules, as the Commission has done in the past for other aeronautical services, recognizing that aircraft rely on

other forms of emergency communications. Introducing an overlay of 911 service would introduce unnecessary confusion, and PSAP operators would be unable to dispatch appropriate assistance. Apart from 911, other CMRS requirements should apply to AGMBS licensees only to the extent they are providing a service that satisfies the definition of CMRS.

With regard to technical rules, Gogo agrees that AGMBS systems can be designed to share the 14 GHz band with GSO satellite systems, but believes that the currently-proposed Section 21.1120 implicitly relies on certain system design assumptions contained in Qualcomm's proposal. The rule should be modified to be less specific to the Qualcomm proposal and to permit greater system design flexibility in avoiding interference to GSO satellites.

Finally, before making substantial investments to acquire spectrum and construct networks, potential licensees must have assurance that their spectrum rights will not be materially eroded by the need to alter their networks in the future to protect new users who may later enter the band. Gogo believes that further investigation is needed regarding the potential for AGMBS interference into (and from) NGSO satellite systems, in order to ensure that AGMBS networks will not be crippled by the possible entry into the band of an NGSO network. In addition, the Commission should re-emphasize that, apart from primary satellite licensees, AGMBS licensees will only be required to protect earlier-licensed co-secondary users and the six existing radio astronomy sites in the band.

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COMMENTS OF GOGO INC.

Gogo Inc. (“Gogo”) hereby submits these comments in the above-referenced docket in response to the May 9, 2013, Notice of Proposed Rulemaking (“NPRM”) in which the Commission proposes to create a secondary allocation for aeronautical mobile services in the 14.0-14.5 GHz band and to establish associated rules governing a new air-ground mobile broadband service (“AGMBS”).¹ As discussed below, Gogo supports the proposed allocation, but suggests a number of revisions and clarifications to the proposed rules to better ensure competition, efficient use of spectrum and the best service for consumers.

I. BACKGROUND

Gogo has been a pioneer in the airborne communications sector for more than 20 years and is a leading provider of in-flight connectivity, with the world’s largest number of online aircraft in service. Through its subsidiaries, Gogo provides a variety of airborne services, including broadband Internet, Wi-Fi based entertainment services, interconnected and non-interconnected VoIP, in-flight portals for e-commerce applications, and flight operations-

¹ Expanding Access to Broadband and Encouraging Innovation through Establishment of an Air-Ground Mobile Broadband Secondary Service for Passengers Aboard Aircraft in the 14.0-14.5 GHz Band, *Notice of Proposed Rulemaking*, 28 FCC Rcd 6765 (2013) (“NPRM”).

oriented communications services. Services are provided to the flying public, commercial airlines, business aviation customers, and government agencies.

Gogo is perhaps best known for launching, in 2008, the first nationwide broadband air-ground network in the United States, relying on 3 MHz of commercial air-to-ground (“ATG”) spectrum in the 800 MHz band, which it obtained at auction. Currently, over 1,900 commercial aircraft are equipped with Gogo’s ATG service, including those flown by Delta Air Lines, American Airlines, United Airlines, US Airways, Virgin America, Air Canada, AirTran Airways, Alaska Airlines, and Frontier Airlines. As of 1Q 2013, Gogo on average offered ATG service on some 6,500 daily flights. Since the inception of the service in 2008, passengers have used Gogo’s service approximately 37 million times.

Gogo is also heavily invested in satellite services, including Ku- and Ka-band technologies. This past May, Gogo received its blanket Earth Station Aboard Aircraft (“ESAA”) license for Ku-band service. Gogo currently leases transponders on 7 satellites and operates through 8 teleports for worldwide Ku-band coverage. Gogo is set to begin service to Delta’s international fleet this fall.

In the general aviation market, over 1,500 aircraft have an ATG broadband service provided by Gogo, and another 5,100 are equipped with Gogo satellite-based solutions that rely either on Iridium and Inmarsat as the underlying facilities-based provider. Gogo’s air-ground communications solutions are offered as standard or optional equipment by virtually every aircraft manufacturer, and are made available to passengers by the largest fractional jet operators such as NetJets, Flexjets, Flight Options and CitationAir. Moreover, Gogo recently acquired LiveTV Airfone, LLC, formerly Verizon Airfone, which currently provides service to general aviation aircraft using a 1 MHz ATG license.

Gogo's long history in the airborne communications sector and its leadership position in both the commercial and general aviation markets make it uniquely qualified to comment on – and to support – the Commission's proposal to allocate additional spectrum for air-ground communications.

II. GOGO SUPPORTS THE NEW ALLOCATION AT 14 GHZ AS ONE OPTION TO SATISFY THE NEED FOR ADDITIONAL AIR-GROUND BROADBAND SPECTRUM

Based on its current operational experience as the leading provider of in-flight broadband, Gogo can confirm the Commission's finding that the demand for broadband connectivity aboard aircraft continues to grow rapidly.² For 2Q 2013, Gogo reported an increase in passenger take rate and revenue for its commercial ATG service.³ As the NPRM correctly notes, Gogo and other parties that filed comments in the Petition for Rulemaking ("PR") docket that preceded this NPRM cited evidence that clearly established the rapidly expanding demand for in-flight broadband.⁴ Thus, the need for additional dedicated air-ground spectrum is already well established in the record.

As explained in its 2011 PR comments, Gogo continuously strives to identify new spectrum opportunities to provide additional capacity for its customers. Gogo is a technology agnostic provider of in-flight services. Over the years Gogo has demonstrated its adaptability in using various spectrum options and technology solutions to offer the best quality and price options available in the market at a given time. For example, Gogo – or Aircell as it was then known – first launched service to the general aviation market by sharing spectrum with rural

² See *id.* ¶ 16.

³ See Press Release, Gogo Inc., Gogo Announces Second Quarter 2013 Results (Aug. 7, 2013), *available at* <http://gogoair.mediaroom.com/2013-08-07-Gogo-Announces-Second-Quarter-2013-Results> (last accessed Aug. 23, 2013).

⁴ NPRM ¶ 25; see Comments of Gogo Inc., RM-11640, at 3-4 (Sept. 29, 2011) ("Gogo PR Comments").

cellular licensees who had excess capacity. Aircell later transitioned to reselling satellite service, and in 2008 Gogo launched its ATG network. In November 2012, Gogo began rolling out its next generation ATG – “ATG-4” – which provides increased bandwidth using the same amount of spectrum.⁵ In April of this year, Gogo obtained the remaining 1 MHz license of 800 MHz ATG spectrum from LiveTV.⁶ In May, Gogo obtained its ESAA license for up to 1,000 terminals operating in the Ku-band, and has already successfully demonstrated that service, which will enable coverage on international flights.⁷ Moreover, Gogo has been selected as a provider of Inmarsat’s forthcoming Global Xpress Ka-band service.

Even with its existing and future spectrum alternatives, however, Gogo believes that the proposed AGMBS in the 14 GHz band could play a role in Gogo’s portfolio of spectrum options. Although satellite-based services offer the advantage of global coverage, satellite solutions are not always the right option for all customers. For example, satellite antennas are larger, heavier, more complex and more expensive than antennas used for terrestrial networks. In many cases they may be too large for, or not economically viable for, smaller aircraft such as private planes or even many commercial regional jets. Satellite service is also less well suited for latency-sensitive applications (like voice), and comes with the risk of launch failures or in-orbit space station failures that can delay or interrupt service for extended periods of time. Therefore, Gogo may find that having additional terrestrial-based spectrum could be beneficial for a significant portion of its customer base.

⁵ See Press Release, Gogo Inc., Gogo Launches Next Generation In-Air Connectivity Technology – ATG-4 (Nov. 12, 2012), *available at* <http://gogoair.mediaroom.com/2012-11-12-Gogo-Launches-Next-Generation-In-Air-Connectivity-Technology-ATG-4> (last accessed Aug. 23, 2013).

⁶ See Application of AC BidCo, LLC, Gogo Inc., and LiveTV, LLC For Consent to Assign Commercial Aviation Air-Ground Radiotelephone (800 MHz band) License, Call Sign WQFX729, *Memorandum Opinion and Order*, 28 FCC Rcd 3362 (2013).

⁷ See FCC Call Sign E120106.

III. THE AGMBS RULES SHOULD PROMOTE COMPETITION AND PROMPT DELIVERY OF SERVICES

A. Four Licenses of 125 MHz Each Should Be Made Available at Auction

Promoting competition is a key statutory goal for the Commission to consider in issuing licenses. In 1993, Congress authorized the Commission to issue licenses “through a system of competitive bidding,”⁸ and further directed it to “promot[e] economic opportunity and competition and ensur[e] that new and innovative technologies are readily accessible to the American people by *avoiding excessive concentration* of licensees and by disseminating licenses among a *wide variety of applicants*.”⁹ This goal can best be met here by dividing the AGMBS band into four licenses of 125 MHz each, and applying a three-year spectrum aggregation limit (discussed further in Section IV.B below) of one license per bidder.

Encompassing an impressive 500 MHz of spectrum, the proposed allocation is more than adequate to support four licenses. A 125 MHz license would be 41 times larger than the three megahertz of spectrum on which Gogo’s current ATG network is operating. Even considering the steady increase in bandwidth-intensive applications used by consumers, Gogo calculates that 125 MHz would provide sufficient spectrum for years to come, especially given that technological advances will continue to make spectrum usage more and more efficient.¹⁰ It would also be sufficient to ensure robust broadband speeds to each aircraft, comparable to or better than speeds typically achieved on terrestrial services.¹¹

⁸ 47 U.S.C. § 309(j)(1).

⁹ *Id.* § 309(j)(3)(B) (emphasis added).

¹⁰ Gogo’s ongoing transition to “ATG4” is one example of such progress. *See supra*, Section II.

¹¹ Based upon Qualcomm’s calculation that a 250 MHz license would yield a 150 Gbps throughput (*see NPRM* ¶ 58), a 125 MHz license would enable 75 Gbps. With regard to commercial aircraft, approximately 50% are airborne over the U.S. during peak hours. Therefore, for a licensee with a served fleet of 3000 aircraft, there would be about 1500 aircraft in the air across the U.S. at any given time. Dividing 75 Gbps by this number of aircraft would mean an average of 50 Mbps would be available to

If there were only one or two licenses available at auction, a bidder would be forced to buy more spectrum than it would likely need. With lower auction prices for smaller-sized licenses, the entry barrier to the market will also be lowered, expanding the potential pool of bidders and making it easier for relatively smaller entities to participate. Moreover, the overall potential market for in-flight broadband and other services is still largely untapped and could certainly support four different service providers. Indeed, there already are four providers operating in the U.S.: Gogo, Row 44, Panasonic Avionics, and LiveTV. Providing for multiple licenses in the band would also be consistent with the Commission's finding in the 800 MHz ATG proceeding that it was in the public interest to promote competition in the band by ensuring access to the spectrum by more than one entrant.¹²

Finally, dividing the band into four licenses would result in licenses with qualitative differences that would increase the options for bidders. For example, the more encumbered portions of the band are at the top and bottom of the band – at 14.0-14.2 MHz and 14.4-14.5 MHz.¹³ In order to protect incumbent co-secondary users and the radio astronomy service (“RAS”), the utility of some of the spectrum in these sub-bands may be diminished. This should result in lower prices at auction for the licenses covering these segments. This could be beneficial for bidders who feel they don't need to use the full 125 MHz, or who have less capital to spend at auction. Meanwhile, well-funded bidders who want to maximize spectrum utility and

every airborne aircraft from a single licensee. A served fleet of 3000 aircraft for a single licensee would represent a reasonable market share, given a commercial passenger aircraft fleet that is just under 6200 aircraft currently, with growth to about 7300 aircraft projected over the next 20 years. See Federal Aviation Administration, FAA AEROSPACE FORECAST 27-28, 57-58 (2013).

¹² Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services, *Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 4403, 4431 ¶ 41 (2005) (“800 MHz ATG Order”).

¹³ See *NPRM* ¶¶ 33-44.

minimize coordination obligations might focus on the “third” license, from 14.25-14.375 MHz, which avoids entirely the encumbered portions of the band.

B. A 125 MHz Aggregation Cap Should Apply for Three Years

The new rules should prohibit any one licensee (including its affiliates) from holding more than 125 MHz of 14 GHz spectrum (*i.e.*, one license) for the first three years. Such a restriction would maximize potential competition by ensuring that at least four entities have an opportunity to enter the AGMBS market. Without this spectrum aggregation limit, one deep-pocketed bidder could monopolize the entire 500 MHz band. While there would still be competition from satellite-based services, terrestrial-based networks have certain advantages over satellite for the domestic market, as Gogo has explained above.¹⁴

During the first three years, the four licensees will have time to better investigate system engineering and cost issues, and to assess their ability to successfully implement their business plan, including discussions with potential customers. If a licensee concludes it does not have a good business case for constructing its network and wishes to sell the license,¹⁵ there would be a two year window – prior to the five-year substantial service deadline which Gogo is proposing below – during which the other AGMBS licensees would be eligible to purchase the license and put it to productive use.¹⁶ In Gogo’s view, this proposal offers the best compromise between

¹⁴ *See supra*, Section II.

¹⁵ This situation occurred in the 800 MHz ATG context, where LiveTV discovered that rapid changes in consumers’ bandwidth expectations rendered its 1 MHz license inadequate to provide an economically viable service. Because no other parties were interested in this 1 MHz license, the FCC granted a waiver of the eligibility rules that permitted Gogo to acquire this license earlier this year. *See supra*, note 6. Gogo’s proposal above avoids the necessity of obtaining a waiver in such a scenario, by providing a two-year window during which consolidation would be permitted in order to prevent licenses from lying fallow.

¹⁶ Of course, the licensee at any time could sell the license to any entity that does not already hold another AGMBS license, but the pool of most promising purchasers would likely be the other AGMBS licensees.

maximizing competition on the one hand, and reducing the likelihood that a license will lie fallow for failure to construct on the other hand.

C. Substantial Service Should Be Required Within Five Years

Given the strong and immediate demand from consumers for additional in-flight broadband capacity in the marketplace, ten years is too long to wait for licensees to construct their spectrum.¹⁷ Such a lengthy period would encourage spectrum speculators and would delay service to the public. The quantity of spectrum at issue is far too large to risk having it lie underutilized for a decade. In the field of wireless communications technologies, ten years is a proverbial eternity; if new air-ground service is not established in the 14 GHz band in the near term, the marketplace will bypass it for other alternatives.

To ensure prompt delivery of service to the public, and for regulatory parity, the Commission should follow its precedent from the 800 MHz ATG proceeding, where it determined that a five-year substantial service requirement was appropriate to comply with its statutory obligation “to prevent stockpiling or warehousing by licensees, and to promote investment in and rapid deployment of new technologies and services.”¹⁸ Gogo, which constructed its nationwide ATG network in less than 26 months, proved that even this five-year deadline was actually longer than needed.¹⁹ Despite the greater complexity of AGMBS base stations, Gogo believes that, for any licensee who seriously intends to provide service, five years would still provide ample time to construct the needed sites. Gogo calculates that full CONUS coverage above 10,000 feet could be achieved with fewer than 200 base stations, with even

¹⁷ See *NPRM* ¶ 76 (proposing to require new licensees in the 14.0-14.5 GHz band to meet substantial service by the end of the proposed ten-year license term).

¹⁸ *800 MHz ATG Order* ¶ 84 (citing 47 U.S.C. § 309(j)(4)(B)).

¹⁹ Gogo obtained its license on October 31, 2006, and filed its substantial service showing on December 11, 2008.

fewer than this needed to meet the safe harbor only. By comparison, a national terrestrial wireless carrier like T-Mobile requires over 50,000 sites to provide nationwide coverage.²⁰

While individual AGMBS base stations are more complicated and costly than traditional cell sites, the substantially fewer numbers of them that are required is a significant mitigating factor that militates against the need for any extended construction period.²¹

Finally, Gogo agrees that the proposed safe harbor metric is adequate to evidence the provision of substantial service.²² However, Gogo suggests clarifying that the service is only required to be provided above 10,000 feet and only to the extent that service requirements are consistent with coordination requirements with secondary users and RAS. Engineering a system to provide service below this altitude could significantly increase network costs with only modest coverage benefits, given that aircraft spend very little time below this altitude and FAA and airline policies currently prohibit the use of consumer electronic devices below 10,000 feet.

D. Multiple Licenses and a Five-Year Substantial Service Deadline Could Mitigate Potential Risks Associated with the Use of Designated Entity Credits

The changes proposed above should alleviate any potential concern that the use of designated entity (“DE”) credits²³ in the auction might increase the risk that much or all of the spectrum could be tied up by an entity that does not have access to the capital and expertise

²⁰ See Kevin Fitchard, “T-Mobile sheds its towers in exchange for a \$2.4B infusion,” Gigaom (Sept. 28, 2012), *available at* <http://gigaom.com/2012/09/28/t-mobile-sheds-its-towers-in-exchange-for-a-2-4b-infusion> (last accessed Aug. 23, 2013) (noting that T-Mobile operates a total of 51,000 cell sites).

²¹ PCS licensees, for example, are required to at least initiate service within five years, although the full license area need not be covered. See 47 C.F.R. § 24.203(b); *see also* 47 C.F.R. § 27.14 (imposing four-year interim build-out requirements for 700 MHz licenses). If the Commission nevertheless declines to accelerate the substantial service deadline, it should, at a bare minimum, require compliance with one or more interim milestones by the five-year mark or earlier. As the NPRM suggested, such milestones could include the completion of system engineering and evidence of steps to procure sites and equipment. See *NPRM* ¶ 76 (seeking comment on whether interim performance or reporting requirements should be adopted).

²² See *NPRM* ¶ 77.

²³ See *id.* ¶ 97 (seeking comment on the proposed use of DE credits).

needed to execute the build-out of a costly network. First, making four licenses available rather than one or two would reduce the amount of capital the DE would need to spend to acquire a license, leaving it with more capital to devote to build-out. Even if the DE is ultimately unable to launch service, only a portion of the band would be tied up, and the five year substantial service requirement should help limit the amount of time that it would be kept from productive use.

With these proposed changes Gogo would not oppose the availability of DE credits, but Gogo does note that an AGMBS network will be very capital intensive to build, making it unlikely that a small business would be able to obtain the funding and specialized expertise needed to plan and construct a viable network. As the NPRM indicated, the Commission in the past has declined to offer DE credits for nationwide services, such as DBS and DARS, “where applicants faced extremely high implementation costs and it was unclear whether small businesses could attract the capital necessary to implement and provide a nationwide service.”²⁴

Gogo disagrees with the NPRM’s assumption that constructing a nationwide AGMBS network would be significantly less costly than these previous nationwide networks,²⁵ and would instead be comparable to the cost of Gogo’s 800 MHz ATG network.²⁶ In fact, the complexity of the AGMBS base stations that will be required to prevent interference to GSO operators will make it considerably more expensive to construct than Gogo’s existing network. Moreover,

²⁴ *Id.*

²⁵ *Id.* For example, the NPRM posits that a licensee may be able to launch service initially only along “primary flight paths,” and gradually phase in additional service areas. Based on Gogo’s experience in the market, no airline would sign a contract for anything short of full CONUS network availability. A single aircraft is typically used on multiple, and changing, routes. The time and cost involved in outfitting a plane with AGMBS antennas and equipment would not be justified by such limited geographic use. In addition, such a plan would create consumer confusion about when and where the service is available.

²⁶ *Id.*

Gogo designed its network and service with the benefit of many years of technical and business experience in the field of aeronautical communications. To be successful, an AGMBS licensee will need both access to significant capital and specialized expertise.

IV. THE RULES SHOULD NOT RESTRICT THE TYPES OF AIR-GROUND SERVICES THAT MAY BE OFFERED

Gogo is concerned that the proposed rules would prohibit the offering of any service that does not qualify as “broadband.”²⁷ Gogo *does* agree that the allocation should be limited to aeronautical mobile uses, in light of the limited availability of dedicated air-ground spectrum as the NPRM notes.²⁸ However, the NPRM enunciates no policy rationale for limiting the use of the spectrum to “broadband” or “high-data-rate” services.²⁹

Customer demand and economics will undoubtedly ensure that AGMBS licensees will, at a minimum, offer some type of broadband data service. But to effectively prohibit the offering of additional services – which might include voice (*e.g.*, VoIP),³⁰ text, or low bandwidth data services – would needlessly limit customer choice, result in less efficient use of spectrum, and make it harder for providers to recoup investment in the network. Accordingly, such a restriction will result in fewer bidders at auction and a lower value for the spectrum. The Commission should instead adopt a more flexible approach as it typically does for auctioned spectrum and follow its policy precedent from the 800 MHz ATG proceeding, where it declared that:

²⁷ See *NPRM* ¶ 50 (proposing that the rules “limit a licensee’s spectrum use to air-ground mobile broadband”); see also Appendix B, draft Section 22.1102 (limiting permissible communications to “mobile broadband”), and draft Section 22.1101 (defining the AGMBS as a service that provides “high-data-rate connectivity”). While draft Section 22.1110 would seem to permit broadcast services as well as “any kind of communications service consistent with ... the Commission’s rules applicable to that service,” it is not clear how this would be interpreted in light of Sections 22.1101 and 22.1102.

²⁸ *NPRM* ¶ 51.

²⁹ See *id.* Appendix B (draft Section 22.1101).

³⁰ While voice service has to date not been permitted by commercial airlines, it remains a popular service in the private aviation market.

We seek to let marketplace forces, rather than prescriptive regulations, determine the highest valued air-ground service applications. Accordingly, a new licensee may provide any type of air-ground service (i.e., voice telephony, broadband Internet, data, etc.) to aircraft of any type, and serve any or all aviation markets (e.g., commercial, government, and general).³¹

Gogo is further concerned that, although not appearing in the proposed rules, the text of the NPRM states that the new service “will have no role in aeronautical operations”³² Again, this lack of flexibility will discourage investment in the spectrum. While the NPRM does not define what is meant by “aeronautical operations,” it could be interpreted to include some of the examples of possible airline applications that Gogo noted in its PR Comments, including:

- the transmission of enhanced weather and flight routing data;
- the offering of video conferencing services to assist in medical and other emergencies;
- the transmission of flight maps; and
- the transmission of detailed reports from the flight management computer regarding detected failures.³³

Gogo is confident that the FAA and airlines would not permit a secondary service to replace existing, dedicated communications paths supporting safety-of-flight operations. But there is no reason why airlines should not be able to use AGMBS to augment their existing capabilities with new applications that could improve safety and efficiency of flight operations, and which would not otherwise be available through other communication paths. In fact, Gogo earlier this month announced a suite of communications services specially developed for Delta’s flight crew that will help improve the efficiency of airline operations.³⁴

³¹ See Amendment of Part 22 of the Commission’s Rules to Benefit the Consumers of Air-Ground Telecommunications Services, *Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 4403, 4431 ¶ 52 (2005).

³² *NPRM* ¶ 2.

³³ Gogo PR Comments at 7.

³⁴ See Press Release, Gogo Inc., “Gogo Launches First Connectivity Service to Support In-Flight Operations with Delta Air Lines (Aug. 22, 2013), available at <http://gogoair.mediaroom.com/2013-08-22->

V. LICENSEES SHOULD BE EXEMPTED FROM 911 RULES AND SHOULD ONLY FACE CMRS REGULATION IF A CMRS SERVICE IS OFFERED

A. Licensees Should Be Exempted from the 911 Rules in Part 20 and Part 9

Although in general Gogo does not object to imposing CMRS rules on AGMBS offerings that meet the definition of CMRS,³⁵ given the unique airborne operating environment, there should be an explicit exemption from the rules mandating 911 capabilities, just as the Commission has done in the past for aeronautical services. In addition to the 911 rules in Part 20, the exemption should also cover the 911 requirements for VoIP providers contained in Part 9, given that any voice services would most likely be VoIP-based.

The appropriate emergency responders during an airborne emergency are the flight crew, who have been specially trained for emergency scenarios. Contacting a traditional public safety answering point (“PSAP”) located 30,000 feet below the caller for emergency assistance is nonsensical at best, and could even “create some potentially dangerous situations,” as the National Emergency Numbering Association (“NENA”) has previously recognized.³⁶ A PSAP cannot dispatch first responders to an airborne 911 caller. Moreover, PSAP personnel are not trained to provide advice on emergency situations occurring in the airborne environment and, unlike the flight crew, would not know where or when the aircraft would be able to land in order to reach ground-based emergency personnel.

Even if it were technically possible for a provider of in-flight CMRS to comply with all of the E911 rules, it would create an unnecessary burden without any corresponding public

Gogo-Launches-First-Connectivity-Service-to-Support-In-Flight-Operations-with-Delta-Air-Lines (last accessed Aug. 26, 2013).

³⁵ See *NPRM* ¶ 92.

³⁶ Letter from Robert Cobb, Executive Director, National Emergency Number Association, to William Gordon, Vice President, Regulatory Affairs, Aircell LLC (Mar. 27, 2008). NENA is the leading professional non-profit organization dedicated solely to 911 emergency communications issues.

safety benefits. The location reporting requirements in particular would be meaningless (and likely impossible to measure for accuracy). Travelling at 500 miles per hour, a 911 caller would be far from the reported location in a matter of minutes.

Understanding the policy arguments against airborne 911, the Commission, in its 1996 order that first established E911 obligations, exempted the existing Air-to-Ground service, explaining that “passengers and crews do not rely on ground-based rescue operations. Instead, passengers and crews of airplanes rely on other radio communications channels.”³⁷ Similarly, in a later order addressing aeronautical services provided by satellite, the Commission clarified that “MSS carriers will be exempt from complying with MSS 911 requirements to the extent that they provide maritime or aeronautical service. . . . We do not see any need to require MSS carriers to provide more than one form of emergency access service. Maritime and aeronautical MSS users already use other forms of emergency service . . . and overlay of a 911 emergency system may introduce unnecessary confusion.”³⁸

Finally, in its 2007 order amending the CMRS 911 rules, the Commission said it would continue to rely on four criteria, first established in the 2003 E911 Scope Order, for analyzing whether any new service should be subject to 911 rules. The criteria are: (1) the service offers real-time, two-way voice service that is interconnected to the public switched network on either a stand-alone basis or packaged with other telecommunications services; (2) the customers using the service or device have a reasonable expectation of access to 911 and E911 services; (3) the service competes with traditional CMRS or wireline local exchange service; and (4) it is

³⁷ Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd 18676, 18717 ¶ 82 (1996).

³⁸ Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, *Report and Order and Second Further Notice of Proposed Rulemaking*, 18 FCC Rcd 25340, 25350-51 ¶ 27 (2003).

technically and operationally feasible for the service or device to support E911.³⁹ Airborne voice and text communications fail to satisfy three out of the four criteria: customers do not reasonably expect to be able to access 911 services at 30,000 feet; airborne services do not compete with traditional (*i.e.*, terrestrial) CMRS or wireline local exchange services; and it is not operationally feasible for the service to support E911. Thus, the Commission should follow its earlier precedent and clarify that its 911 and E911 rules will not apply to AGMBS licensees.

B. CMRS Regulation Should Only Apply to the Extent the Offered Service Satisfies the CMRS Definition

As explained above, licensees should be able to provide a variety of services. Thus, Gogo supports the NPRM's proposal that AGMBS licensees be permitted to specify their regulatory status – which may include more than one category – just as most other auctioned wireless services are permitted to do.⁴⁰ However, earlier in the same paragraph, the NPRM broadly proposes to classify the entire AGMBS as a commercial mobile radio service (“CMRS”).⁴¹ A CMRS classification for the entire service could create confusion for a provider who, for example, only offers broadcast or broadband Internet access services, which do not meet the definition of CMRS.⁴² Thus, the adopting order should be clear that a licensee will only be regulated as a CMRS provider to the extent it offers a service that meets the definition of CMRS, as the NRPM itself later suggests.⁴³

³⁹ See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064, 8114 ¶ 135 (2007).

⁴⁰ See NPRM ¶ 54.

⁴¹ *Id.*

⁴² See 47 C.F.R. § 20.3 (a service must be interconnected to meet the definition of CMRS).

⁴³ See NPRM ¶ 54 (“service offerings may bear on eligibility and other statutory and regulatory requirements”); see also *id.* ¶ 92 (“[t]o the extent a licensee provides a CMRS, such service would be subject to” CMRS rules).

VI. THE NPRM CORRECTLY INDICATES THAT AGMBS LICENSES WOULD ONLY NEED TO PROTECT EARLIER-LICENSED CO-SECONDARY USERS IN THE BAND

Gogo understands that the new AGMBS would operate on a secondary basis and believes that GSO operations can be adequately protected. Gogo also understands the obligation to protect existing secondary and other incumbent users in the band, which includes: (1) three Tracking and Data Relay Satellite System (“TDRSS”) sites operated by NASA in the 14.0-14.2 GHz band;⁴⁴ (2) six existing Radio Astronomy Service (“RAS”) stations in the 14.47-14.5 GHz band;⁴⁵ and (3) various existing secondary Federal users in the 14.4-14.5 GHz band.⁴⁶ Gogo believes that AGMBS licensees generally should be able to coordinate with and protect these existing users, although it may result in some AGMBS service “holes” in certain areas.

In its order adopting final rules, the Commission should reiterate what it has clearly noted in the NPRM: that AGMBS licensees would only be required to protect “earlier-licensed secondary services” and the currently existing RAS facilities.⁴⁷ In order to devote the substantial capital that will be required to acquire licenses at auction and construct a network, prospective licensees must have some assurance – before making the investment – that their spectrum rights will not be materially eroded in the future by the need to protect additional users.

VII. THE PROPOSED TECHNICAL RULES SHOULD BE MODIFIED TO BE LESS SPECIFIC TO THE QUALCOMM PROPOSAL

Gogo has evaluated Qualcomm's analysis of interference of an AGMBS system into GSO systems, and agrees that it is feasible to develop overall architectures that will limit the $\Delta T/T$ to less than 1%. The FCC's proposed limit for the total transmitted power toward the GSO arc of

⁴⁴ See *NPRM* ¶ 33.

⁴⁵ See *id.* ¶ 40; 47 C.F.R. § 2.106 (n. US203).

⁴⁶ See *NPRM* ¶ 15, nn.18-19.

⁴⁷ *Id.* ¶¶ 37, 44-45 (citing 47 C.F.R. § 2.104(d)(3)(i-iii)).

-46.7 dBW/Hz offers a reasonable safety margin, as it is equivalent to a $\Delta T/T$ of less than 0.5%⁴⁸ for an average satellite G/T of 2 dB.

However, the proposed rule Section 21.1120 appears to incorporate specific elements of the system that Qualcomm hypothesized. It may be construed as constraining the freedom of licensees to design and manage their networks, subjecting them to unwarranted and unnecessary constraints derived from the Qualcomm petition. For instance:

i) The equation in proposed Section 21.1120(a) is:

$$-74.5 - 10\log\left(\frac{n}{150}\right)\frac{dBW}{Hz} \text{ for } 150 \leq n \leq 250 \quad (1)$$

Implicit in this equation is an assumption of 600 beams operating simultaneously (*i.e.*, $-74.5 + 10\log(600) = -46.7$), and a limitation of 250 sites within an AGMBS system. Alternative system designs could have more or less than 4 co-channel beams per site, and may evolve to a number of sites greater than 250.

ii) Emissions from the aircraft could be controlled by Section 21.1120(b), in which the aggregate EIRP towards the orbital arc is limited to -47.0 dBW/Hz. There is no apparent reason for a TDD system to have different interference limitations for operations on the forward and reverse links.

iii) Section 21.1120(c) would appear to limit rain compensation power increases to 6 dB for base stations, and would require a compensating reduction in the number of beams transmitted. This proposal doesn't appear to support rain compensation power increases on the aircraft-base station links, incorporates a maximum power increase that may not be consistent with some possible system designs, and fixes a compensation mechanism for increases in power that may not be necessary.

We suggest that Section 21.1120 be clarified to remove the implicit references to the Qualcomm system design, and to make it clear that licensees must ensure compliance with a limitation of -46.7 dBW/Hz transmitted towards the orbital arc, where this limitation is to be met for all sources (base stations and aircraft), under all operational conditions (including rain fade compensation). The overall objective should be to allow a licensee the flexibility to utilize antenna system designs, establish geographic site layouts, and provide link budgets for clear sky

⁴⁸ See *NPRM* ¶ 101-104, Appendix B (draft Section 22.1120).

and rain fade conditions, as well as develop overall system control methodologies, that are consistent both with protecting GSO satellite systems from harmful interference and with developing an AGMBS system that is consistent with the licensee's view of the most effective system implementation.

VIII. FURTHER INVESTIGATION IS NEEDED REGARDING POTENTIAL INTERFERENCE TO AND FROM FUTURE NGSO SATELLITES

The NPRM noted that there are no current NGSO satellite operations in the 14.0-14.5 GHz band, and that Qualcomm has provided an analysis that demonstrated no harmful interference to a hypothetical future NGSO system.⁴⁹ The NPRM did not propose a specific rule for protection of NGSO systems.

While there are no known plans for a NGSO system, there have been several applications filed previously with the FCC.⁵⁰ These NGSO systems presented a wide range of system configurations, and suggest that Qualcomm's hypothetical NGSO system may not be representative of worst case, or even typical, NGSO interference scenarios. Some key system parameters are summarized in Table 1 below:

⁴⁹ See NPRM ¶ 105.

⁵⁰ See SAT-LOA-19990108-00006 (Boeing), 130-SAT-AMEND-98, SAT-AMD-19980630-00056 and SAT-AMD-19990108-00004 (Skybridge), 160-SAT-P/LA-97(13) and SAT-AMD-19990108-00001 (Denali Telecom), SAT-LOA-19990108-00002 (Hughes H-Link), SAT-LOA-19990108-00003 (Hughes H-Net), SAT-LOA-19990108-00005 (Teledesic), and SAT-LOA-19990108-00007 (Virgo).

Table 1 - Comparison of NGSO System Parameters

	Qualcomm's hypothetical Ku-band NGSO system	NGSO applications	
		Minimum value	Maximum value
GS antenna minimum elevation to NGSO satellite ⁵¹	15 ^o	5 ^o	10 ^o
Satellite G/T	-7.0 dB/K	-9.6 dB/K	+21.2 dB/K
Satellite Altitude	1000 km	1469 km	5,784 to 43,000 km

Clearly, Qualcomm's hypothetical system has parameters that represent a very low orbit configuration, and it is not clear that NGSO interference would be as manageable as indicated by the record. Both the interference into an NGSO system and the interference received from an NGSO system may be far greater than can be reasonably accommodated by constraints on the design and management of an AGMBS system, especially considering that an NGSO system may be proposed and deployed long after the design of the AGMBS system is fixed.

Under current NGSO satellite rules and the proposed AGMBS rules, changes to the AGMBS system that might be required to avoid interference into a newly launched NGSO system, and to avoid interference into the AGMBS system from the NGSO system, could result in crippling the performance of the AGMBS system. This could result in service disruptions to the flying public and airlines, and in considerable reduction in the value of the investment made by the licensee in acquiring spectrum and designing and deploying a network.

Gogo urges further investigation of the potential for interference into (and from) NGSO systems in order to ensure that the rules for both NGSO and AGMBS systems provide a reasonable degree of certainty in the development of AGMBS systems.

⁵¹ The minimum and maximum values shown at the right do not include the minimum elevation angle for the Teledesic application.

IX. CONCLUSION

The Commission should adopt its proposal to establish a new aeronautical mobile secondary allocation in the 14 GHz band, which has the potential to significantly expand the in-flight broadband capacity available to consumers as well as to airlines, private aircraft and government entities. However, the rules must be drafted to promote competition and investment in the band, and to ensure the prompt delivery of services, as discussed above.

Respectfully submitted,

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